S/057/63/033/003/017/021
B104/B180

AUTHOR: Ionov, N. I.

TITLE: Three-electrode probes as a means of investigating a cosmic plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 33, no. 3, 1963, 366-368

TEXT: The probe is shown in Fig. 1. The flat grid C_2 which is perpendicular to the velocity vector of the cosmic ship has the same or only slightly different potential as the ship. The plasma penetrating C_2 is separated by means of the quite high potential difference between C_1 and C_2 so that, depending on the sign of the charge to the collector K, either a positive ion current or a negative charges will flow. The magnitude of these currents may be measured in dependence on the analyzing potential difference between K and C_2. The volt-ampere characteristic of this probe is shown in Fig. 2. It is assumed that the initial energy of the charged particle has a Maxwell distribution and that the ship's speed is much less than the

Card 1/3

Three-electrode probes as a means of ...

velocity of the thermal electron motion. From the volt-ampere characteristic one can determine: (1) The initial-energy distribution curve for the charged particles. (2) The potential difference between C_2 and the plasma. (3) The shift of the characteristic caused by the ship's speed. (4) The ions and electron concentrations. There are 2 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad
(Physicotechnical Institute imeni A. F. Ioffe AS USSR, Leningrad)

SUBMITTED: June 6, 1962

Fig. 1.

S/057/63/033/003/017/021
B104/B180

Three-electrode probes as a means of ...

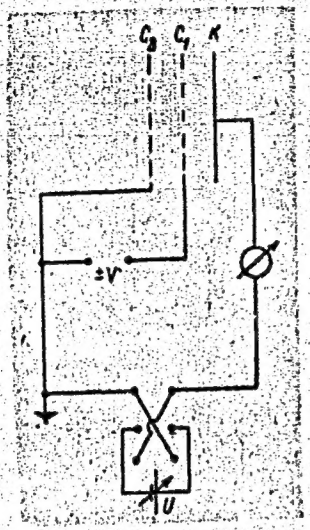

Fig. 1

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IONOV, N.I., MITTSEV, M.A.

Use of surface ionization phenomena in studying catalytic reactions on a surface. Dokl. AN SSSR 152 no.1:137-139 S '63. (MIRA 16:9)

1. Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR.
Predstavleno akademikom B.P.Konstantinovym.
(Ionization) (Catalysis) (Surface chemistry)

ACCESSION NR: AP4018379 S/0120/64/000/001/0138/0141

AUTHOR: Ionov, N. I.; Karatayev, V. I.

TITLE: Two-stage magnetic mass spectrometer

SOURCE: Pribory* i tekhnika eksperimenta, no. 1, 1964, 138-141

TOPIC TAGS: spectrometer, mass spectrometer, magnetic mass spectrometer, two stage magnetic mass spectrometer, mass spectrometry

ABSTRACT: A further development of these authors' two-stage mass spectrometer (PTE, 1962, no. 3, p. 119) is described. In this model, a change in the ion-path radius in the second stage is effected by means of a step change in the magnetic field intensity. Dispersion formulas are derived. A sample mass spectrum of isotopes (K^{39}, K^{40}, and K'') of nautral potassium illustrates the feasibility of measuring two peaks differing by one mass unit and having an intensity ratio of $10^9/10^7$. These advantages over the previous model are

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ACCESSION NR.: AP4018379

claimed: (1) The entire chamber volume is under the same potential; there is no necessity of an additional internal chamber insulated from the external; (2) Easier alignment procedure and sweep. Orig. art. has: 3 figures and 10 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Physico-Technical Institute, AN SSSR)

SUBMITTED: 02Mar63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: PH NO REF SOV: 002 OTHER: 000

Card 2/2

ACCESSION NR: AP4022712 S/0020/64/155/002/0309/0311

AUTHOR: Bakulina, I. N.; Ionov, N. I.

TITLE: Determining the energy of electron affinity of copper, silver and gold atoms by the surface ionization method

SOURCE: AN SSSR, Doklady*, v. 155, no. 2, 1964, 309-311

TOPIC TAGS: electron affinity, energy, copper, silver, gold, surface ionization method, iodine

ABSTRACT: The energy of the electron affinity of copper, silver, and gold atoms was determined by a method previously described by the authors (ZhFKh, 33, No. 9, 2063 (1958)) in which the currents of the negative ions of two elements are compared during surface ionization on heating a polycrystalline tungsten filament to 1800-2300K. The electron affinity energy (S) of iodine was used for comparison (S = 3.07 ev). In the relationship $\frac{I_1}{I_2} = \frac{n_1 A_1}{n_2 A_2} \exp \frac{e(S_1 - S_2)}{kT}$, n_1 and n_2 are the surface flows of atoms of the elements investigated, I_1/I_2 is the current

Card 1/2

OTHER: 002

ACCESSION NR: AP4013429 S/0057/64/034/002/0354/0360

AUTHOR: Ionov, N.I.; Tontegode, A.Ya.

TITLE: Probe characteristics obtained with various types of probe in mercury and cesium vapor gas discharge plasmas

SOURCE: Zhurnal tekhn.fiz.,v,34, no.2, 1964, 354-360

TOPIC TAGS: plasma, mercury plasma, cesium plasma, gas discharge plasma, plasma diagnostics, probe, plasma probe

ABSTRACT: Probe measurements in mercury and cesium vapor gas discharge plasmas were undertaken primarily to observe the behavior of a type of multi-electrode probe proposed long ago by one of the authors (N.I.Ionov,DAN SSSR 85,753,1952) and subsequently ignored. Both electron and ion characteristics were obtained. The 6 cm long hot cathode discharge was produced in a 7.5 cm diameter glass tube. The multi-electrode probe consisted of four plane electrodes, the dimensions of which are not given but which measured more than 4 mm in at least one direction. These electrodes were mounted parallel to the axis of the discharge at 3 mm intervals in a centrally located side tube, the first electrode closing the entrance to the side tube. The

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ACCESSION NR: AP4013429

first three electrodes had rectangular openings for passage of ions and electrons, and the fourth electrode served as collector. The mercury and cesium vapors were frozen out of the side tube by a liquid nitrogen trap. A simple cylindrical probe was mounted opposite the multi-electrode probe for comparison. The multi-electrode probe could be operated as a simple plane probe by connecting all the electrodes together, or it could be operated as a two, three, or four electrode probe as desired. When two electrodes were employed, the analyzing potential was applied between the first electrode and the plasma, and a constant potential to distinguish between ion and electron current was applied between this electrode and the collector. When the probe was used as a three or four electrode device, the first electrode was kept at the plasma potential to prevent disturbance of the plasma by the probe field. When all four electrodes were employed, one electrode served to suppress photoelectric and secondary electron emission from the collector. Two groups of thermal electrons of widely different temperature were observed in both plasmas at suitable pressures (2×10^{-1} to 9×10^{-3} tor for mercury and 3×10^{-3} to 4×10^{-4} tor for cesium). At lower pressures, at least in the mercury plasma, the electron distribution became non-Maxwellian. The temperatures obtained for the hotter group of electrons (of the order of 10^4 °K) varied considerably, depending on the probe connection employed. From the measurements reported, and many not reported, the authors

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ACCESSION NR: AP4013429

draw the following conclusions: 1) The electron characteristic of the plane probe at small retarding potentials, as well as the observed plasma potential and electron density, is practically independent of the number of electrodes employed. 2) At large retarding potentials, the one, two, and three electrode probes give different results. This is due to errors inherent in one and two electrode probe systems. 3) The fourth electrode is required for correct measurements in rarefied plasmas such as occur in interplanetary space. 4) The cylindrical probe characteristic differs from the plane probe characteristic in all conditions investigated. Orig.art. has: 7 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im.A.F.Ioffe AN SSSR, Leningrad (Physical-Technical Institute, AN SSSR)

SUBMITTED: 28Dec62 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: PH, SD NR REF SOV: 002 OTHER: 002

3/3
Card

ACCESSION NR: AP4020587 S/0057/64/034/003/0546/0557

AUTHOR: Ageyev, V.N.; Ionov, N.I.; Ustinov, Yu.K.

TITLE: Application of a pulse mass spectrometer to investigation of adsorption characteristics by the flash method

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.3, 1964, 546-557

TOPIC TAGS: pulse mass spectrometer, pulse mass spectrometer manometer, flash desorption curve, carbon monoxide desorption, carbon dinoxide desorption, water desorption, hydrogen desorption, oxygen desorption

ABSTRACT: The pulse mass spectrometer described by Ye.I.Agishev and N.I.Ionov (Zh TF,28,1775,1958) was employed as the partial pressure gage in an investigation of adsorption characteristics by the flash desorption method proposed by J.A.Becker and C.D.Hartman (J.Phys.Chem.57,157,1953) and further developed by G.Ehrlich (J. Chem.Phys.34,29,1961) and others. The theory of the flash method is developed briefly and the principal equations are derived. A 0.025 mm diameter 120 mm long tungsten wire served as the adsorber. This was mounted near the ion source at one end of the 2 liter mass spectrometer chamber. During the heating of the wire (duration

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ACCESSION NR: AP4020587

about 0.1 sec) the accelerating potential was applied in 50 microsec pulses at regular intervals. The ions automatically sorted themselves into mass groups during their drift to the ion detector (a secondary electron multiplier) at the far end of the spectrometer chamber. A four grid ion gate was located directly in front of the detector and was so pulses as to permit only ions of a selected mass to be recorded. The amplified ion current, after being smoothed by an integrating circuit with an appropriate time constant, was displayed on an oscilloscope. The temperature of the tungsten adsorber, obtained from the unbalance voltage of a bridge in the heating circuit, was also displayed on the same oscilloscope. Thus, flash heating and desorption curves for a selected molecule were simultaneously automatically recorded. Flash desorption curves were obtained for CO, H_2O, H_2, O_2 and CO_2 after adsorption had been permitted to proceed for times varying from 0.25 to 30 min. The residual gas pressure during these measurements was about 8×10^{-8} torr. The authors consider this the most serious inadequacy of the present apparatus, and they are taking steps to reduce this pressure. All the desorption curves except those for hydrogen were complex. In the case of CO, three phases were distinguished, which are tentatively identified as the α, β_2 and β_3 phases of Ehrlich (loc.cit.supra). Ehrlich's phase β_1 was not found. The activation energy for desorption of CO from phases β_2

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ACC.NR: AP4020587

and β_3 was deduced from the desorption curves. It was found that desorption from β_2 is a first order reaction with activation energy 1.6 eV and desorption from β_3 is a second order reaction with activation energy 2.4 eV. The rather large discrepancy between these activation energies and those found by other investigators is ascribed to inaccurate temperature measurement by the other workers. An increasing final CO pressure observed at high temperatures is ascribed, as it has been by others, to oxidation of carbon diffusing from within the tungsten. The reaction was found to be with H_2O and not with CO_2. "The authors are grateful to Ye.I.Agishev for advice and assistance during development of the apparatus." Orig.art.has: 13 formulas and 10 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR, Leningrad (Physical-Technical Institute, AN SSSR)

SUBMITTED: 06Feb63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: PH NR REF SOV: 006 OTHER: 009

Card 3/3

ACCESSION NR: AP4035684 S/0057/64/034/005/0769/0787

AUTHOR: Ionov, N.I.

TITLE: Investigation of gas discharge and cosmic plasmas with multielectrode probes

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.5, 1964, 769-787

TOPIC TAGS: plasma, rarefied plasma, plasma diagnostics, simple probe, multielectrode probe, gas discharge, cosmic plasma

ABSTRACT: This is a review article, and consequently contains no new information. The measurement of ion and electron densities and velocity distribution with the aid of probes is discussed from its inception by Langmuir to recent applications in satellite research. The discussion is limited to rarefied plasmas in which the mean free path is long compared with the dimensions of the space-charge region that forms about the probe; applications to dense plasmas and to plasmas in strong magnetic fields are not discussed. Theoretical derivations are few and are limited to plane probes. The first half of the paper deals with laboratory measurements. The simple (single electrode) probe is discussed in considerable detail, and the use of two

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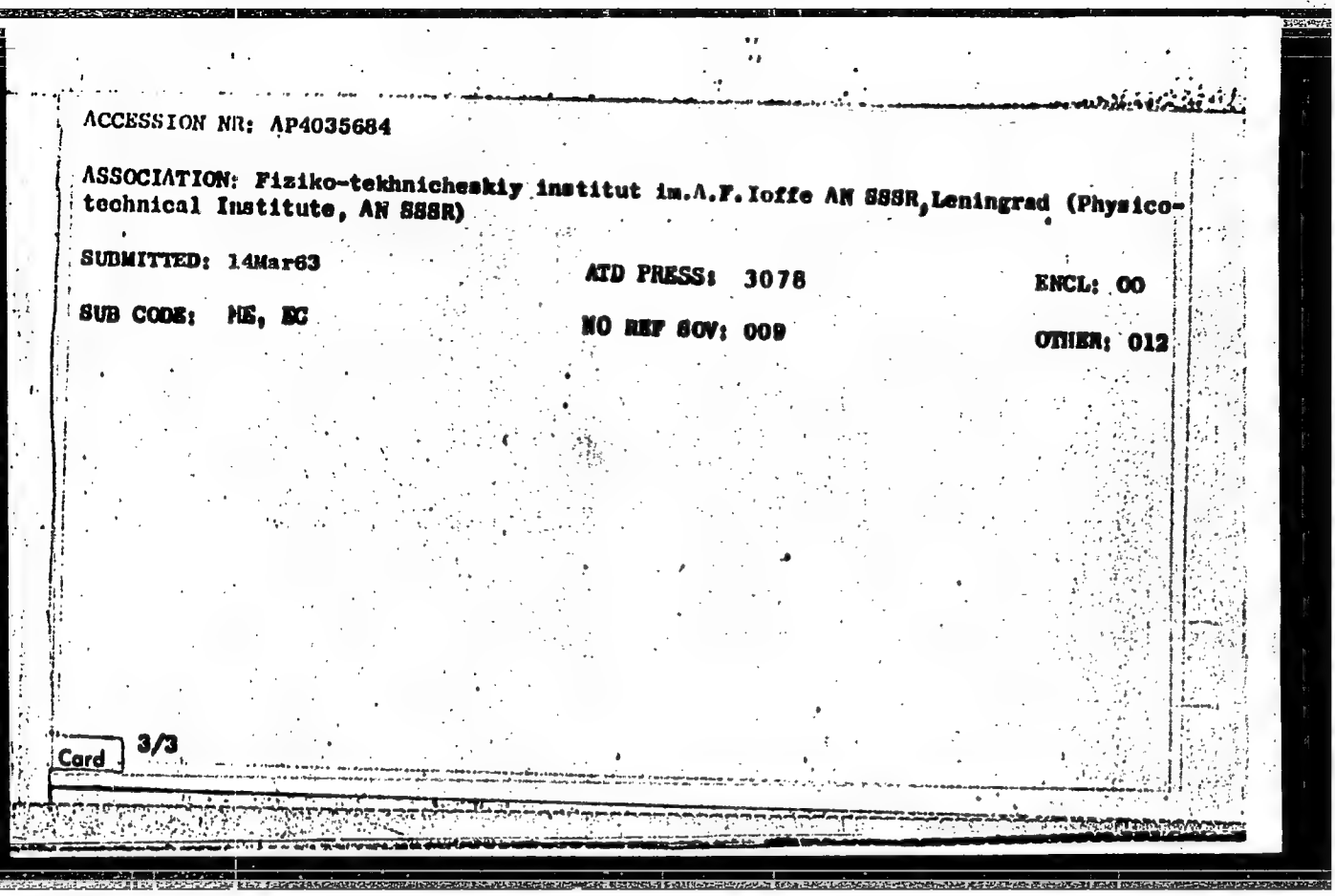
ACCESSION NR: AP4035684

probes to investigate an electrodeless discharge is described. The deficiencies of the simple probe and their causes are pointed out. The author then discusses the addition of a second electrode to separate the ion and electron currents, a third electrode to limit the space-charge region and thus minimize the disturbance of the plasma by the probe, and a fourth electrode to suppress photo- and secondary emission. This section ends with a brief review of recent work by the author and A.Ya. Tontegode (ZhTF,34,354,1964) in which they compared the behavior of one-, two-, three- and four-electrode probes under similar conditions. In the second half of the paper the author discusses the problems peculiar to the investigation of plasmas in space. These arise mainly from the tenuity of the plasmas and the motion of the instrument. The discussion is illustrated by descriptions of instruments employed and results achieved by both Soviet and American workers in space research, ranging from simple probes carried on early V-4 flights to the four-electrode "ion trap" of Explorer-10. The paper concludes with the suggestion that valuable results might be obtained by subjecting the charged particles of one polarity, collected by a multi-electrode probe, to magnetic analysis. Orig.art.has: 12 formulas and 23 figures.

Card 2/3



ACCESSION NR: AP4035684

ASSOCIATION: Fiziko-tekhnicheskiy institut im.A.F.Ioffe AN SSSR,Leningrad (Physico-technical Institute, AN SSSR)

SUBMITTED: 14Mar63 ATD PRESS: 3078 ENCL: 00

SUB CODE: ME, EC NO REF SOV: 009 OTHER: 012

Card 3/3

BAKULINA, I. N.; IONOV, N. I.

Electron affinity energy of copper, silver, and gold atoms as determined by the surface ionization method. Dokl. AN SSSR 155 no. 2:309-311 Mr '64. (MIRA 17:5)

1. Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR. Predstavleno akademikom B. P. Konstantinovym.

L 19019-65 EWT(m)/EPF(c)/T/EWP(t)/EWP(b) Pr-4/Pb-4 (ASD(S)-2/SSD/AFWL/ IJP(c) JD/JG

ACCESSION NR: AP4049049 S/0057/64/034/011/2056/2066

AUTHOR: Ageyev, V. N.; Ionov, N. I.; Ustinov, Yu. K.

TITLE: Investigation of chemisorption of hydrogen on polycrystalline tungsten by the flash method with a pulsed mass spectrometer 27 27

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.11, 1964, 2056-2066

TOPIC TAGS: chemisorption, hydrogen, carbon monoxide, tungsten

ABSTRACT: An investigation of the adsorption of hydrogen on a tungsten surface was undertaken because of the large discrepancies among the results of other investigators. The flash method was employed, and the partial pressures of the desorbed gas-

undertaken because of the large discrepancies among the results of other investigators. The flash method was employed, and the partial pressures of the desorbed gases were measured with a pulsed mass spectrometer, as described previously by the authors (ZhTF 34, 546,1964). A number of improvements were made in the apparatus. Vacua of the order of 10^{-9} torr were attained, and with the system closed and the pumps off, the pressure remained below 10^{-7} torr for as long as a week. The adsorber was a 12 cm long, 2- micron diameter polycrystalline tungsten wire. It was flashed with direct current, and its resistance (and hence temperature) was measured with high-frequency alternating current. Flash curves of pressure and resistance

versus time were simultaneously displayed on an oscilloscope. In all the experiments the desorption was complete at a temperature below 1000°K; thus, no appreciable quantity of atomic hydrogen was involved. The desorption curves were complex and indicated the presence of two adsorbed phases, both of which were desorbed by second order reactions. The rate constants and activation energies for the two phases were found to be 1.4×10^{-6} cm^2/sec and 0.61 eV, and 0.14 cm^2/sec and 1.48

phases were found to be 1.4×10^{-2} cm^2/sec and 0.01 eV, and 0.14 cm^2/sec and 1.40 eV, respectively. These phases were not the same as those reported by J.Eisinger (J.Chem.Phys.29,5,1958), and it is suggested that his results were due to displacement of adsorbed hydrogen by carbon monoxide, an effect that was observed and measured in the present work. It is concluded that the two phases are due to two different types of adsorption centers distributed over the surface of the metal. Arguments are presented to support this view, and potential energy curves are given for adsorption in the two different phases. "The authors thank P.A.Mamyrin for assistance in developing the electronics for the experimental apparatus." Orig.art.has: 8 formulas and 11 figures.

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L 19019-65
ACCESSION NR: AP4049049

ASSOCIATION: Fiziko-tekhnicheskiy institut im.A.F.Ioffe AN SSSR, Leningrad
(Physicotechnical Institute, AN SSSR)

SUBMITTED: 09Mar64 ENCL: 00

SUB CODE: GC NR REF SOV: 006 OTHER: 014

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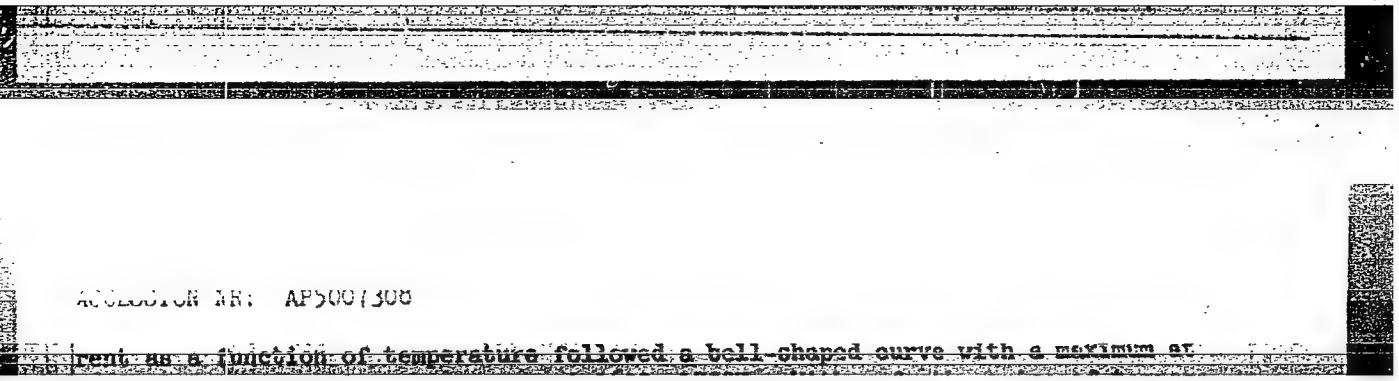
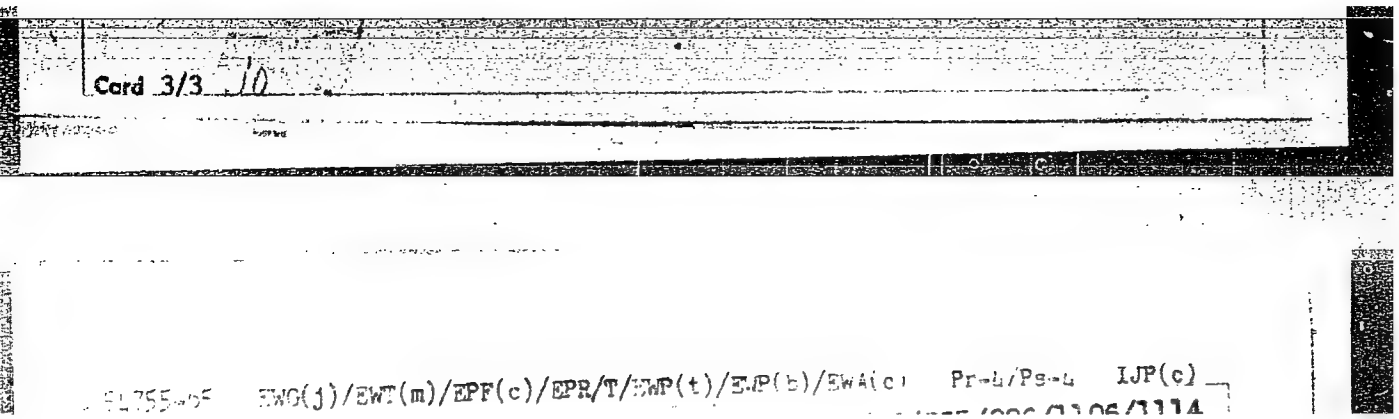


ACCESSION NR: AP5007308

rent as a function of temperature followed a bell-shaped curve with a maximum at

increased with the temperature. The effective work function for Mg^+ ions, which were obtained by injection of Mg from special evaporizers onto the filament, was found to be 5.16—5.20 v in the 2000—2600K temperature range. The atom ionization potentials V (for m/e = 29) were V_{29} = 6.3 to 7.3 v; V_{44} = 5.8 to 6.2 v; V_{55} = 6.2 to 6.3 v; V_{85} = 5.9 to 6.4 v; and V_{wo} = 6.0 to 6.4 v. The case of V_{51} = 9.3 to 10.9 v indicates that the ion with m/e = 51 was fractional. The temperature independence of the ion current with m/e = 84 indicates that the atom ionization potential for this compound is equal to or lower than the work function value of 5.1 v. These experiments demonstrated that many organic molecules and radicals possess a



L 54755-65 EWG(j)/EWT(m)/EPF(c)/EPR/T/EWP(t)/EWP(b)/EWA(c) Pr-4/Ps-4 JQP(c)
JD/JW/JG
ACCESSION NR: AP5015636 UR/0057/65/035/006/1106/1114

55
52
B

AUTHOR: Ustinov, Yu.K.; Ageyev, V.N.; Ionov, N.I.

TITLE: Investigation of chemisorption of carbon monoxide on polycrystalline tungsten wires by the flash method

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.6, 1965, 1106-1114

TOPIC TAGS: chemisorption, adsorption, carbon monoxide, tungsten,

TOPIC TAGS: chemisorption, adsorption, carbon monoxide, tungsten, activation energy

ABSTRACT: This paper reports a continuation of previous work of the authors on the chemisorption of CO on W (ZhTF 34,546,2056,1964). The flash desorption method has been described in the earlier papers. The flash desorption method was employed, and a pulsed time-of-flight mass spectrometer was used to measure the desorbed gas. The residual pressure was [illegible] mm Hg. The adsorbers were 12 cm long 0.025 mm diameter tungsten wires. New wires were heated at 2600°K for one hour before use and all were heated at 2400°K for one minute between measurements.

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L 54755-65

ACCESSION NR: AP5015636

2

[illegible] activation energies of 0.57.

Three adsorbed phases with desorption activation energies of 0.57, [illegible] and 3.87 eV were found; these are identified with the phases α, β_1 and β_2, respectively, of G.Ehrlich and J.Hudda (J.Chem.Phys.35, [illegible] 1960). Ehrlich's β_3 phase was sought but not found. The authors' [illegible] report (loc.cit.supra) of this phase was erroneous, and was due to an incomplete separation of the β_1 and β_2 phases. A peak tentatively identified with Ehrlich's β_3 phase in the early stages of [illegible] present work was shown by mass spectrometer measurements to be [illegible] hydrogen. The authors note that Ehrlich and Hudda did not use [illegible] spectrometer. The adsorption of [illegible] phases. The two β phases were [illegible]

Card 2/3

L 54755-65
ACCESSION NR: AP5015636

ASSOCIATION: Fiziko-tekhnicheskiy institut im.A.F.Ioffe AN SSSR,

IONOV, N.I.

On 2π-radian focusing of ion beams in a magnetic field. Prib. i tekh. eksp. 10 no.1:137-140 Ja-F '65. (MIRA 18:7)

1. Fiziko-tekhnicheskiy institut AN SSSR.

BAKULINA, I.N.; ZANDBERG, E.Ya.; IONOV, N.I.

Emission of positive and negative molecular ions from heated surfaces. Zhur. tekh. fiz. 35 no.3:562-567 Mr '65.
(MIRA 18:6)

1. Fiziko-tekhnicheskiy institut imeni Ioffe AN SSSR, Leningrad.

USTINOV, Yu.K.; AGEYEV, V.N.; IONOV, N.I.

Use of the flash method in studying the chemisorption of carbon oxide on polycrystalline tungsten filaments. Zhur. tekh. fiz. 35 no.6: 1106-1114 Je '65. (MIRA 18:7)

1. Fiziko-tekhnicheskiy institut imeni A.F.Ioffe AN SSSR, Leningrad.

L 2304-66 EWT(m)/EPF(c)/EWA(d)/T/ JD/JW
ACCESSION NR: AP5020742

UR/0057/65/035/008/1504/1515

AUTHOR: Zandberg, E. Ya.; Ionov, N. I.; Tontegode, A. Ya.

TITLE: Mass spectrometric determination of the heat of vaporization of atoms and positive ions in sublimation of polycrystalline rhenium, tungsten, tantalum, and molybdenum

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 8, 1965, 1504-1515

TOPIC TAGS: heat of sublimation, vacuum sublimation, atom, ion, work function, mass spectometer, rhenium, tungsten, tantalum, molybdenum

ABSTRACT: The authors have directly determined the vaporization energies L_a and L_i of atoms and ions from polycrystalline surfaces of the refractory metals Re, W, Ta, and Mo. These measurements are said to be the first direct determinations of L_i. The samples were 45 mm long 100 to 150 micron polycrystalline wires located on the common axis of three cylindrical grids to which appropriate potentials could be applied. Positive ions leaving the surface of the sample were extracted by negative potentials on the cylindrical grids and their flux was measured with a mass spectrometer. When atoms were being investigated, the ions were excluded by

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L 2304-66
ACCESSION NR: AP5020742

positive potentials on the grids. The atoms diffused into a chamber where they were ionized by an electron beam and the resulting ion flux was measured with the mass spectrometer. The use of a mass spectrometer to determine the composition of the sublimed gas is considered essential. When the residual gas pressure in the apparatus was 10^{-7} mm Hg, only atoms and atomic ions were found; when the pressure was (1-5) x 10^{-6} mm Hg, oxide molecules and molecular ions were also present. The temperature of the sample was determined with an optical micropyrometer, and the position of the sample and the electrode system was monitored by measuring the surface ionization of indium. The samples were subjected to a prolonged preliminary heating at the highest temperature employed in the measurements. The vaporization energies were determined from the temperature dependences of the fluxes. The thermodynamic theory of this determination is derived and the type of average over the different crystallographic faces to which it leads is discussed. It is not possible directly to test the consistency of the data by means of the Schottky relation $L_a - L_i = e(W - V)$, where W is the work function and V is the ionization potential, because the different quantities are averaged differently. The question of averages is discussed at some length, and inequalities are derived that the measured values of L_a, L_i, and W should (and do) satisfy. The statistical error of the vaporization energy measurements was approximately 5%. A systematic error as great as 4% is possible in the Mo and Ta temperature measurements. The values ob-

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L 2304-66

ACCESSION NR: AP5020742

6

thined for L_a are compared with those found by other authors, and some discrepancies are discussed. "The authors are grateful to N.D.Potekhina for participating in a discussion of the work." Orig. art. has: 24 formulas, 5 figures, and 1 table

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR, Leningrad (Physico-technical Institute, AN SSSR)

SUBMITTED: 08Feb65 ENCL: 00 SUB CODE: NP, SS

NR REF SOV: 009 OTHER: 012

Card 3/3

L 7224-66 EPA(s)-2/EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JW/JG

ACC NR: AP5025902 SOURCE CODE: UR/0057/65/035/010/1863/1868

AUTHOR: Ionov, N.I.; Mittsev, M.A.

ORG: Physicotechnical Institute im. A.F.Ioffe,AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Thermal dissociation of sodium chloride and iodide on a tungsten surface

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 10, 1965, 1863-1868

TOPIC TAGS: heat of dissociation, sodium chloride, iodide, tungsten, metal surface, surface ionization

ABSTRACT: The thermal dissociation of NaCl and NaI on a W surface was investigated with the aid of a 90° mass spectrometer employing an electron multiplier recording device with a sensitivity of 10^{-17} A. The NaX atoms (X represents Cl or I) from two ovens were incident on the surface of an electrically heated 55 X 1 X 0.01 mm^3 tungsten strip at an angle. The temperature of the tungsten surface was determined with an optical pyrometer in the temperature range from 1100 to 2500 °K; lower temperatures were determined from the heating current by extrapolating the pyrometer data. Particles leaving the tungsten strip perpendicularly entered the mass spectrometer through a system of slits which excluded molecules coming directly from the ovens. When neutral particles were to be observed a retarding potential was applied between

Card 1/2 UDC: 539.196.6

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L 7724-66

ACC NR: AP5025902

the tungsten strip and the slit system to prevent entrance of ions, and the neutral particles entering the spectrometer were ionized by an electron beam. The energy of the ionizing electrons was kept below the threshold for dissociative ionization of NaX. Under these conditions there were observed Na^+, X^+, NaX^+, and Na_2X^+ ions. The Na_2X^+ ions are ascribed to dissociative ionization of Na_2X_2. When ions were to be observed, an accelerating potential was applied to the slits and the electron beam was removed. Under these conditions only Na^+ ions were observed. Curves are given showing the currents for all the molecular species (corrected for the ionizing efficiency of the electron beam) as functions of the temperature of the tungsten surface. The theory of surface dissociation is discussed and the dissociation energies of NaCl and NaI are derived from the experimental data. The resulting dissociation energies, namely, 4.35 ± 0.07 and 3.0 ± 0.1 eV for NaCl and NaI, respectively, are in good agreement with those obtained by other investigators using spectroscopic, thermochemical, and fluorescence methods. It is concluded that the surface dissociation technique can be useful for determining dissociation energies of different molecules. Orig. art. has: 10 formulas and 4 figures.

SUB CODE: GC, NP/ SUBM DATE: 25Feb65/ ORIG REF: 004/ OTH REF: 002

Card 2/2

L 10675-66 EWT(m)/T/EWP(t)/EWP(b)/EWA(c) LJP(c) JD/JG

ACC NR: AP5028327 SOURCE CODE: UR/0057/65/035/011/2099/2108 10 69 B

AUTHOR: Ustinov, Yu. K.; Ionov, N. I. 44,55 44,55

ORG: Physico-technical Institute im. A.F.Ioffe, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR) 44,55

TITLE: Investigation of chemisorption of nitrogen on polycrystalline tungsten wires by the flash method 27 44,55 17

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 11, 1965, 2099-2108

TOPIC TAGS: gas adsorption, chemisorption, nitrogen, tungsten, crystal

ABSTRACT: The adsorption of nitrogen on 12 cm long 0.025 mm diameter polycrystalline tungsten wires has been investigated by the flash method, using a pulsed time-of-flight mass spectrometer to measure the gas pressure during the flash. Simultaneous adsorption of N_2, CO, and H_2 was also investigated. The apparatus and the experimental and data processing techniques have been described elsewhere by V.N.Ageyev, N.I.Ionov, and Yu.K.Ustinov (ZhTF 34, 546, 2056 (1964), 35, 1106 (1965)). The α and β adsorbed phases of T.W.Hickmott and G.Ehrlich (Phys. Chem.Solids, 5, 47, 1958) were observed, and two β phases were distinguished. The parameters C, n, and E in the expression $CN^n \exp(-E/kT)$ for the rate of decrease of the surface concentration N of adsorbed nitrogen molecules were found to be 10^{-1} cm^2/sec, 2, and 2.4 eV, respectively, for one of the β phases and 3×10^9 cm^2/sec, 2, and 6.5 eV, respectively.

Card 1/2 UDC: 541.18

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L 10675-66

ACC NR: AP5028327

for the other. From the fact that n = 2 it is concluded that in the β phases nitrogen is adsorbed as atoms and desorbed as molecules. The easily desorbed α phase was observed only at high surface concentrations, and it never contained more than 5% of the total number of adatoms. The sticking probability of nitrogen molecules on the tungsten surface at 300°K was 0.22 for surface concentrations below 3×10^{13} molecule/cm^2 and was very small for higher concentrations. The equilibrium surface concentration of nitrogen on tungsten at 300° K and 10^{-7} mm Hg was 1.2×10^{14} molecule/cm^2. CO and H_2 were readily adsorbed even when the tungsten surface was saturated with N_2. From this it is concluded that N_2 is easily adsorbed on some crystal faces and practically not at all on others. The nitrogen adsorbing faces filled roughly half the surface area of the tungsten wire. The data are discussed in terms of the theory of "layered" adsorption, and it is shown that they are not inconsistent with this theory. The possibility of deriving information concerning the adsorption process from equilibrium measurements is discussed and some preliminary measurements are presented. The present experimental technique, however, is not adequate to realize the full potentialities of the equilibrium method. Orig. art. has: 4 formulas and 6 figures.

SUB CODE: 20, 07 SUBM DATE: 10Feb65/ ORIG. REF: 003 OTH REF: 011

Card 2/2

L 10070-66 EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD/JG

ACC NR: AP5028328 SOURCE CODE: UR/0057/65/035/011/2109/2116

AUTHOR: Ageyev, V.N.; Ionov, N.I. 44,55 44,55

ORG: Physico-technical Institute im. A.F.Ioffe, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR) 44,55

TITLE: Investigation of chemisorption of oxygen on polycrystalline tungsten by the flash method 44,55,27

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 11, 1965, 2109-2116

TOPIC TAGS: gas adsorption, chemisorption, oxygen, tungsten

ABSTRACT: The adsorption of oxygen on 12 cm long 0.025 mm diameter polycrystalline tungsten wires has been investigated by the flash method, using a pulsed time-of-flight mass spectrometer to measure the gas pressure during the flash. The apparatus and experimental technique have been described elsewhere by the authors and Yu. K. Ustupov (ZhTF 34, 3, 546, 2056 (1964)). After outgassing by the usual techniques in a vacuum of 10^{-9} mm Hg, the tungsten wire was heated for 100 hours at 2300°K in an atmosphere of 10^{-6} mm Hg of O_2 and subsequently for 40 hours at 2200° K in 10^{-7} mm Hg of O_2. After this treatment the adsorbed oxygen was desorbed as O_2, whereas prior to the treatment only desorption of CO and CO_2 had been observed. An ionization gage gave higher pressure readings below 3×10^{-8} mm Hg than did the mass spectrometer; this is ascribed to desorption of O^+ ions from the grid of the ionization gage. Thermo-

Card 1/3

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electron emission from the tungsten wire during flashing was suppressed by an appropriate potential difference between the wire and the walls of the spectrometer to avoid thermoelectron stimulated desorption of O_2, CO, and CO_2 from the surrounding surfaces. Two adsorbed phases (named β_1 and β_2) were distinguished. The parameters C, n, and E in the expression $CN^n \exp(-E/kT)$ for the rate of decrease of the surface concentration N of adsorbed oxygen molecules were found to be $(2 \pm 0.6) \times 10^{-7}$ cm^2/sec, 2, and 1.5 ± 0.2 eV, respectively, for the β_1 phase, and 120 ± 18 cm^2/sec, 2, and 6.1 ± 0.4 eV, respectively, for the β_2 phase. From the value 2 for n it is concluded that oxygen is adsorbed as atoms and desorbed as molecules. The sticking probability of an oxygen molecule on the tungsten surface was 0.14 at low surface concentrations and temperatures from 300 to 1800° K, where the adsorption is mainly into the β_2 phase, and was 0.07 at 300° K and higher surface concentrations where the adsorption is mainly into the β_1 phase. The equilibrium concentration of adsorbed oxygen on tungsten at 300° K was 5×10^{14} molecule/cm^2, with roughly half the adatoms in each of the two phases. It was found that oxygen displaces adsorbed CO molecules from the high temperature β_2 state; in this process one O_2 molecule displaces two CO molecules. The results of the present work are compared with those of a number of other investigators. The value 0.14 for the sticking probability is in agreement with the finding of J.A. Becker, E.J.Becker, and R.G.Brandes (J. Appl. Phys., 32, 411, 1961) but is much smaller than the values obtained by J.Eisinger (J. Chem.Phys., 30, 412, 1959) and R.E.Schlier (J.Appl. Phys., 29, 1162, 1958). The value obtained for the equilibrium concentration of adsorbed oxygen agrees with those found by Becker, Becker and Brandes, and by

L 10676-66

ACC NR: AP5028328

Schlier (loc. cit.); from this it is concluded that desorption of oxygen as oxygen atoms or as tungsten oxides (which would not have been detected in the present work) did not occur to a significant degree. No indication was found of significant diffusion of oxygen into the body of the adsorbent. Orig. art. has: 3 formulas and 6 figures.

SUB CODE: 20,07 SUBM DATE: 18Mar65/ ORIG. REF: 007 OTH REF: 011

Card 3/3

BAKULINA, I.N.; IONOV, N.I.

Absolute energies of electron affinity of halogen and sulfur atoms. Zhur. fiz. khim. 39 no. 1:157 Ja '65 (MIRA 19:1)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR. Submitted November 1, 1963.

IONOV, N. V.

IONOV, N. V.: "Vascular reactions in patients before and after and operation." Min Health FRSFSR. Leningrad Sanitary-Hygiene Medical Inst. Leningrad, 1956. (Dissertation for the Degree of Candidate in Medical Sciences)

Source: Knizhnaya letopis' No. 28 1956 Moscow

Country : USSR
Category : Human and Animal Physiology, Internal Secretion

Abs. Jour. : Ref Zhur Biol, No. 2, 1959, No. 8266

Author : Ionov N.V.
Institut. : Karaganda Medical Institute
Title : Vascular Reactions in Thyrotoxicosis.

Orig Pub. : Tr. Karagandinsk. med. in-ta, 1957, 1, No. 3, 219--220

Abstract : The plethismographic curves of 20 patients with thyrotoxicosis had a markedly wave-like pattern; it was not possible to obtain a zero plethismogram. Reflex vascular reactions were characterized by great lability, the absence of a latent period, impeded extinction of the orientation reaction to conditioned stimuli, a spastic reaction to unconditioned stimuli and impeded establishment of the conditioned reflex and differentiation. After treatment with bromides and drug-induced sleep, the plethismographic curves lost their wave-like character. Reactions to unconditioned stimuli were not as sharp and were more proportional to the stimulus.

Card: 1/2

Country : USSR
Category : Human and Animal Physiology, Internal Secretion

Abs. Jour. : Ref Zhur Biol, No. 2, 1959, No. 8266

Author :
Institut. :
Title :

Orig. Pub. :

Abstract : Following surgery a zero plethismogram could be obtained. Also noted was a normalization of vascular tone (pulse and arterial pressure).-

Card: 2/2

Ionov, N.V.

IONOV, N.V. (Karaganda, bul'var Mira, d.9, kv.17)

Pre- and postoperative vascular reactions [with summary in English, p. 159] Vest.khir. 79 no.7:64-68 Jl '57. (MIRA 10:10)

1. Iz fakul'tetskoy khirurgicheskoy kliniki (zav. - prof. M.G. Shrayber) Karagandinskogo meditsinskogo instituta.

(SURGERY, OPERATIVE,
preop. & postop. plethysmography (Rus))
(PLETHYSMOGRAPHY,
preop. & postop. (Rus))

IONOV, N.V., (Karaganda, bul'var Mira, d.9, kv.7)

Extensive gastric, duodenal and pancreatic resection for gastric sarcoma. Vest.khir. 80 no.4:116-117 Ap'58 (MIRA 11:5)

1. Iz kafedry fakul'tetskoy khirurgii (zav. - prof. M.G. Shrayber) Karagandinskogo meditsinskogo instituta.

(STOMACH NEOPLASMS, surg.
extensive duodenal & pancreatic resection with gastrectomy for sarcoma (Rus))
(GASTRECTOMY
with extensive duodenal & pancreatic resection for gastric sarcoma (Rus))
(DUODENUM, surg.
extensive resection in gastrectomy for sarcoma (Rus))
(PANCREAS, surg.
same)
(SARCOMA, surg.
gastrectomy with extensive duodenal & pancreatic resection for gastric sarcoma (Rus))

ICNOV, N.V.

Comparative evaluation of anesthetic methods according to clinical materials. Trudy Inst. klin. i eksp. khir. AN Kazakh. SSR 9:120-122 '63. (MIRA 17:12)

IVANOV, Yevgeniy Abramovich, kand.tekhn.nauk; STOLBIN, G.B., kand.tekhn. nauk, retsenzent; IONOV, P.I., inzh., red.; EL'KIND, V.D., tekhn. red.

[Clutches; construction atlas] Mufty dlia privodov; atlas konstruktsii. Moskva, Gos. nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1957. 190 p. (MIRA 11:3)
(Clutches (Machinery))
(Machine tools)

IONOV, P.M., inzhener, redaktor; TIKHONOV, A.Ya, tekhnicheskiy redaktor.

[Engines 2D 16,5/20 1 and 2DSP 16,5/20 1; collection of designs] Dvigateli 2D 16,5/20 1 i 2DSP 16,5/20 1; al'bom chertezhei. Izd. 2-oe, ispr. Moskva, Ges.nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1956. 35 p. of diagrams. (MLRA 9:6)

1.Dizelestroitel'nyi zavod "Kommunist", Moscow.
(Diesel engines)

SAPOZHNIKOV, Matvey Yakovlevich; SILENOK, S.G., inzh., retsenzent; IONOV, P.M., inzh., red.; CHERNOVA, Z.I., tekhn. red.

[Machinery of the building materials industry; atlas of designs]Mashiny promyshlennosti stroitel'nykh materialov; atlas konstruktsii. Izd.2., perer. i dop. Moskva, Mashgiz, 1961. 215 p. (MIRA 15:10)
(Building materials industry--Equipment and supplies)

LAPIR, F.A.; SUSNIKOV, A.A.; SHAGINOV, D.L., dots.; OGIYEVICH, A.I., kand.tekhn.nauk,retsenzent; IONOV,P.M.,inzh.,red.; SMIRNOVA,G.V., tekhn.red.

[Mechanical equipment of plants manufacturing precast reinforced concrete elements; atlas of technical drawings]Mekhanicheskoe oborudovanie zavodov sbornykh zhelezobetonnykh izdelii; atlas konstruktsii. Pod red. D.L.Shaginova. Moskva, Mashgiz, 1962. 128 p. (MIRA 15:12)

(Concrete plants--Equipment and supplies)

REZNICHENKO, V.S.; KYUBLER, O.A.; BOLTUKHIN, A.K., dots., retsenzent; IONOV, P.M., inzh., red.

[Transparent drawing and design stencils and materials; album of drawings] Prozrachnye chertezhno-konstruktorskie trafarety i prinadlezhnosti; al'bom chertezhei. Moskva, Mashinostroenie, 1964. 130 p. (MIRA 17:8)

BOLKHOVITINOV, N.F., doktor tekhn. nauk, prof.; BOLKHOVITINOVA, Ye.N., kand. tekhn. nauk, dots.; IONOV, P.M., inzh., red.

[Atlas of macro- and microstructures of metals and alloys] Atlas makro- i mikrostruktur metallov i splavov. Izd.3. perer. i dop. Moskva, Mashinostroenie, 1964. 101 p. (MIRA 17:8)

FOYGEL'MAN, Grigoriy Abramovich; SKVORTSOV, G.D., inzh., retsenzent; IONOV, P.M., inzh., red.

[Album of drawings of universal dies, die blocks and units for sheet-metal work] Al'bom konstruktsii universal'nykh shtampov, blokov i uzlov dlia kholodnoi shtampovki. Moskva, Mashinostroenie, 1965. 120 p. (MIRA 18:11)

IONOV, P. S.

IONOV, P. S. (Col. Veterinary Service). Examination of gastric contents in horses.

So: Veterinariya; 22; (2-3); February/March 1945; Uncl.
TABCON

KONOV, P.S.; DOMRACHEV, G.V., prof.; FADDEYEV, L.A.; BRANZBURG, A.Yu., red.; DEGLIN, M.A., tekhn.red.

[Diagnosis of diseases of the horse; concise manual for the military veterinarian] Diagnostika boleznei loshadi; kratkoe rukovodstvo dlia voiskovogo veterinarnogo vracha. Pod red. G.V. Domracheva. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1945. 178 p. (MIRA 13:3)

(Horses--Diseases and pests)

IONOV, P. S.

Laboratory tests in veterinary clinical diagnosis. Moskva, Gos. izd-vo selkhoz lit-ry 1953. 252 p. (Uchebniki i uchebnye posobiia dlia vysshikh sel'skokhoziaistvennykh zavedenii)

USSR/Medicine - Veterinary, Textbook

Card 1/1

Author : Shishkov, V. and Ginzburg, A., Veterinary Physicians (reviewers)
Title : "Review of 'Laboratornyye issledovaniya v veterinarnoy klinicheskoy diagnostike' (Laboratory examinations in veterinary clinical diagnosis)" by P. S. Ionov et al
Periodical : Veterinariya, 31, 58-60, Apr 1954
Abstract : P. S. Ionov, V. G. Mukhin, A. I. Fedotov, and I. G. Sharabrin have intended this book primarily for students in veterinary colleges and to provide reference material for laboratory workers and practicing veterinary physicians. Importance of this book is enhanced by the fact that all previously published textbooks and manuals on the methods of clinical and laboratory diagnosis in veterinary medicine have been sold out and have become somewhat obsolete. Notable advances have been made in the past few years in the Soviet Union in the field of veterinary medicine; veterinary clinicists have contributed much new to the veterinary laboratory-clinical diagnostic methods. All these advances have been incorporated in this book. The book was published in 1952 by the State Publishing House of Sovhoz and Kolkhoz Literature, Moscow, 252 pp, Fifteen thousand copies.

Institution :

Submitted :

Ionov, Petr Semenovich

IONOV, Petr Semenovich; KUMSIYEV, Shalva Alekseyevich; SHAPTALA, Ivan Prokof'yevich; MUSIN, A.D., red.; GOR'KOVA, Z.D., tekhn.red.

[Principles of therapeutic practice in veterinary medicine; with elements of diagnosis] Osnovy terapevticheskoi tekhniki v veterinarii; s elementami diagnostiki. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1957. 274 p. (MIRA 11:1)
(Veterinary medicine)

IONOV, P.S.

[Laboratory research in clinical veterinary diagnosis] Laboratornye issledovaniia v veterinarnoi klinicheskoi diagnostike. Izd. 2-e, perer. Moskva, Gos. izd-vo selkhoz lit-ry, 1957. (MIRA 11:4)
(Veterinary medicine)

ZAYTSEV, Vladimir Ivanovich, prof.; SINEV, A.V., prof.; IONOV, P.S., prof.; VASIL'YEV, A.V., prof.; SHARABRIN, I.G., prof.; SOLOVEY, A.S., red.; BALLOD, A.I., tekhn.red.

[Clinical diagnosis of internal diseases of domestic animals] Klinicheskaia diagnostika vnutrennikh boleznei domashnikh zhivotnykh. Pod red. V.I.Zaitseva. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1958. 375 p. (MIRA 12:3)
(Veterinary medicine--Diagnosis)

IONOV, P.S., prof.; KUMSIYEV, Sh.A., doktor veterinarnykh nauk

Method for studying the urinary systems of mares and cows.
Veterinariia 37 no.9:54-55 S '60. (MIRA 14:11)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti.
(Mares) (Cows) (Urinary organs)

TSIREL'SON, N.B., prof.; IONOV, P.S., prof.

Effect of feeds grown with the application of gibberellin on the animal organism. Veterinariia 37 no.10:63-64 O '60. (MIRA 15:4)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti.

(Feeds) (Gibberellin)

IONOV, P. S. (Professor), and TIMOSHKIN, Z. F. (Assistant, Moscow Technological Institute of Meat and Milk Industry)

"Motorial function of the omasum of cattle as affected by vegetable bitters".

Veterinariya, Vol. 38, No. 2, 1961, p. 54.

IONOV, P. S. (Professor) and TIMOSHKIN, Z. F. (Assistant, Moscow Technological Institute of the Meat and Milk [Dairy] Industry)

A "Application of white helleborne [Veratrum album] in atonia of the omasum."

Veterinariya, Vol. 38, No. 3, 1961, p. 64.

IONOV, P. S., RADKEVICH, P. E. and KUMSIYEV, Sh. A.

"Internal non-infectious diseases of cattle."
M. Sel'khozgiz, 1961.

Veterinariya, vol. 39, no. 8, August 1962, p. 88

MOZGOV, I.Ye., akademik, red.; IONOV, P.S., prof., red.; OSTAPENKO, K.A., kand. veter. nauk, red.; OSIPOV, V.N., red.

[Prophylaxis and therapy of noninfectious diseases of farm animals] Profilaktika i lechenie nezaraznykh boleznei sel'skokhoziaistvennykh zhivotnykh. Pod red. I.E.Mozgova, P.S. Ionova, K.A.Ostapenko. Moskva, Izd-vo "Kolos," 1964. 254 p. (MIRA 17:7)

1. Nauchno-metodicheskaya konferentsiya o merakh profilaktiki nezaraznykh bolezney sel'skokhozyaystvennykh zhivotnykh.
2. Vsesoyuznaya akademiya sel'skokhozyaystvennykh nauk imeni V.I.Lenina (for Mozgov)

ZAYTSEV, V.I., prof.; SINEV, A.V., prof.; IONOV, P.S., prof.;
VASIL'YEV, A.V., prof.; SHARABRIN, I.G., prof.;
ZELEPUKIN, V.S., red.

[Clinical diagnosis of internal diseases in farm animals]
Klinicheskaia diagnostika vnutrennikh boleznei sel'sko-
khoziaistvennykh zhivotnykh. 2. perer. i dop. izd. Moskva,
Kolos, 1964. 350 p. (MIRA 17:11)

IONOV, P.S., prof.; TIMOSHKIN, Z.F., assistent

Effect of amaroids on the motor function of the rumen in cattle. Veterinariia 38 no.2:54-55 F '61. (MIRA 18:1)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti.

IONOV, P.S., prof.; TIMOSHKIN, Z.F., assistent

Use of white false hellebore tinctures for treating the atony of rumen. Veterinariia 38 no.3:64-65 Mr '61 (MIRA 18:1)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti.

IONOV, P.S., prof., polkovnik veterinarnoy sluzhby v otstavke

Military veterinary field therapy during the Patriotic War.
Veterinariia 42 no.5:13-15 My '65. (MIRA 18:6)

IONOV, P.S., prof.; USHA, B.V., aspirant

Diagnosis of liver diseases in cattle. Veterinariia 42 no.7:58-59 Jl '65. (MIRA 18:9)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti.

L 36939-66 EWT(1)/EWP(m)/EWT(m) WW/JW/GD

ACC NR: AT6022646 SOURCE CODE: UR/0000/66/000/000/0062/0071

74
B+1

AUTHOR: Ambartsumyan, Ye. N.; Ionov, P. V.; Kon'kov, A. A.

ORG: none

TITLE: Spectroscopic investigation of gases heated by shock waves

SOURCE: AN SSSR. Energeticheskiy institut. Issledovaniya po fizicheskoy gazodinamike (Studies of physical gas dynamics). Moscow, Izd-vo Nauka, 1966, 62-71

TOPIC TAGS: spectrographic analysis, gas spectroscopy, spectral absorptivity, radiation spectrum, thermal radiation, radiation spectrometer, SHOCK WAVE HEATING

ABSTRACT: This article reports an experimental study of the spectral characteristics of highly luminous gases heated by strong shock waves with velocities from 2 to 10 km/sec produced in a shock tube. A schematic representation of the experimental setup is presented. A detailed account is given of the techniques used for production of shock waves and for measurements. Nitrogen, argon, air, and a mixture of nitrogen and CO_2 were investigated in temperature ranges from 5000 to 10,000K, with pressure from 5 to 50 atm, and wavelength from 6000 to 3000 Å. A special arrangement for obtaining time-resolved spectra is described which has certain advantages over a drum camera. The analysis of spectra obtained for all gases shows the presence of 1) continuum radiation, 2) impurity lines of Fe, Cr, Cu, Ca, and others, and 3) CN lines of the violet system and probably lines of the $N_2(1+)$, $N_2(2+)$, $NO(\beta)$ systems in the spectra of air, nitrogen, and CO_2-N_2 mixture. In the time-resolved spectra,

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a secondary emission was observed. The distribution of spectral absorptivity referred to the unit of length of the absorption layer with respect to the wavelength which was obtained for nitrogen and a CO_2-N_2 mixture from quantitative analysis of spectra using heterochromatic scanning. Orig. art. has: 19 figures and 5 formulas. [AB]

SUB CODE: 20/ SUBM DATE: 31Feb66/ ORIG REF: 003/ OTH REF: 002/ ATD PRESS: 5136

Card 2/2 llb

AMBARTSUMYAN, Ye.N.; IONOV, P.V.; KON'KOV, A.A. (Moscow)

"Investigation of the optical properties of gases behind strong shock waves"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964

L 43151-66 EWT(m)/EWP(j)/EWP(t)/ETI IJP(c) RM/GD/JD
ACC NR: AT6022647 SOURCE CODE: UR/0000/66/000/000/0072/0080

AUTHOR: Ambartsumyan, Ye. A.; Ionov, P. V.; Kon'kov, A. A.

ORG: none

TITLE: Experimental determination of the oscillator strength of the violet system of the CN radical

SOURCE: AN SSSR, Energeticheskiy institut. Issledovaniya po fizicheskoy gazodinamike (Studies of physical gas dynamics). Moscow, Izd-vo Nauka, 1966, 72-80

TOPIC TAGS: oscillator strength, emissivity, spectral absorptivity, cyanogen

ABSTRACT: The emissivity and absorptivity of the (0-0) band of the violet system of CN were measured in the range of 5000-10,000°K, and the results made it possible to determine the matrix element of the transition dipole moment of this system. The experiments involved the use of a shock tube which produced shock wave velocities up to 10 km/sec. It was found from the absorptivity data that $R_e = (0.35 \pm 0.08)$ at. u., and $f_e = (0.027 \pm 0.06)$. The time required by the system to reach equilibrium was found to be 20-10 μsec for T = 5000-6000°K and p = 12-25 atm; at higher temperatures and pressures, this time approximately coincides with the time resolution of the system (~2-3 μsec). Orig. art. has: 6 figures and 14 formulas.

SUB CODE: 07,20/SUBM DATE: 31Feb66/ ORIG REF: 003/ OTH REF: 005

Card 1/1 MLP

BYKOV, V.N.; IONOV, R.A.; RUDENKO, V.A.

Structure of thin oxide films on iron-silicon alloys.
Fiz. met. i metalloved. 20 no.3:472-474 S '65.
(MIRA 18:11)

L 26632-66 EWP(e)/EWT(m)/EWP(t) IJP(c) JD/WB/WH

ACC NR: AP5025339 SOURCE CODE: UR/0126/ 65/020/003/0472/0474

AUTHOR: Bykov, V. N.; Ionov, R. A.; Rudenko, V. A.

ORG: None

TITLE: The structure of thin oxide films on iron-silicon alloy

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 3, 1965, 472-474

TOPIC TAGS: iron base alloy, silicon containing alloy, polycrystalline film, electron diffraction analysis, iron oxide, silicon dioxide

ABSTRACT: The structure of thin oxide films in the range of 1000 Å which form on the surface of iron-silicon have been studied by means of electron diffraction techniques. The alloys used in this experiment contained from 1 to 5% silicon by weight. The oxide films were formed by heating the polished flat samples in a furnace at 700°C for a period of 3 minutes. The oxide films were stripped from the surface in a solution of iodine-ethyl alcohol. The electron diffraction technique showed that only α-Fe_2O_3 was present on the surface of the sample. The analysis of oxide films formed on the surface of alloys Fe + 4% Si and Fe + 5% Si revealed in addition to α-Fe_2O_3 the presence of α-cristobalite. The electron

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ACC NR: AP5025339

diffraction technique did not show the presence of α-cristobalite since it apparently exists inside the oxide film close to the surface of the metal. When the separated oxide films were subjected to heating at 1100°C for a period of two hours the silicon oxide was transformed into α-cristobalite with the crystal size of more than 200 Å. On the basis of these findings it can be concluded that the film consists of α-Fe_2O_3 and SiO_2. The SiO_2 is in a form of fine α-cristobalite particles and amorphous SiO_2. In the initial stage of oxidation of alloys containing a high percentage of silicon an SiO_2 layer is formed at the metal interface which slows down the diffusion of iron ions through the oxide layer and thus slows the rate of oxidation. Orig. art. has: 1 fig. and 1 table.

SUB CODE:11,20/ SUBM DATE: 04Sept64/ ORIG REF: 003/ OTH REF: 004

Card 2/2

VYKHODTSEV, I.V.; GUSAROVA, A.N.; POPOVA, L.I.; IONOV, R.N.; BAKALO, V.Ya.; TSYBINA, Ye.V., tekhnicheskiy redaktor

[Recommendation for grass seeding and irrigation of mountain pastures in the Tien Shan and Issyk-Kul provinces and the Susamyr] Rekomendatsii po vysokogornomu travoseianiiu i oroshcniiu pastbishch v Tian'-Shan'skoi, Issyk-Kul'skoi oblastiakh i na Susamyre. Frunze, 1956. 11 p. (MIRA 9:9)

1. Akademiya nauk Kirgizskoy SSR, Frunze. Institut botaniki.
2. Institut botaniki i Institut vodnogo khozyaystva i energetiki Akademii nauk Kirgizskoy SSR (for Vykhodtsev, Gusarova, Popova, Ionov, Bakalo)

(Issyk Kul Province--Pastures and meadows)
(Tien Shan Province--Pastures and meadows)

IONOV, R.N.; VYKHODTSEV, I.V., red.; ANOKHINA, M.G., tekhn.red.

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Molecular orbits of a sulfite ion. Zhur. neorg. khim. 10 no.9:1961-1965 S '65. (MIRA 18:10)

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1. Submitted December 14, 1964.

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AUTHORS: Dmitriyev, A.V., Ionov, V.A. 132-58-4-8/17

TITLE: Automated Reduction in Gamma-Ray Aerial Survey (Automatizatsiya privedeniya pri aerogrammas"yemke)

PERIODICAL: Razvedka i Okhrana Nedr, 1958, 24 Nr 4, pp 31-36 (USSR)

ABSTRACT: In gamma-ray aerial surveys, the intensity of the gamma radiation decreases sharply when the gamma rays pass through the atmospheric layers. Therefore, it is necessary to take into consideration the height at which the aerial survey is carried out. Up until now, the registration of the height and of the gamma radiation have been conducted separately, and only by joint laboratory processing could the reduction of the field be ascertained. The introduction of 2 devices, which can be easily installed in existing radiometers, is proposed: an automatic height corrector, by which the variation of the intensity of gamma radiation at varying heights can be calculated by the King Function, and a device for the automated reduction of the field. These devices will increase the effectiveness of aerial surveying and eliminate complicated laboratory calculations and adjustments.

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Automated Reduction in Gamma-Ray Aerial Survey 132-58-4-8/17

There are 3 graphs.

ASSOCIATION: Institut prikladnoy geofiziki AN SSSR (Institute of Applied Geophysics AS USSR)

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Card 2/2 1. Gamma rays-Measurement 2. Radiometers-Applications

S/089/61/010/006/007/011
B136/B201

AUTHORS: Balyasnyy, N. D., Boltneva, L. I., Dmitriyev, A. V., Ionov, V. A., and Nazarov, I. M.

TITLE: Determination of the content of radium, thorium, and potassium in rocks from an aircraft

PERIODICAL: Atomnaya energiya, v. 10, no. 6, 1961, 626-629

TEXT: A three-channel analyzer allowing measurements to be made in three energy ranges with automatic subtraction of the background has been used for effecting spectroscopic gamma measurements. The integral sensitivity was 350 pulses/sec per microroentgen/hour. The channels worked (1) in integral operation with a cut-off of 0.5 Mev to eliminate the effect of the soft scattered gamma radiation; (2) in the 1.6-1.9 Mev energy range; (3) in the 1.9-2.7 Mev energy range. The contents of the individual elements were determined by equations

$$n_1(h) = n_{11}Ra + n_{12}Th + n_{13}K$$

$$n_2(h) = n_{12}Ra + n_{22}Th$$

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Determination of the content of ...

$$n_{3\varphi}(h) = n_{31}Ra + n_{32}Th$$

Here, Th and K denote the percentual thorium and potassium contents, Ra the percentual radium content of equilibrated uranium, $n_{1,2,3}$ the counting rates, $\varphi(h)$ the reference coefficient to the earth's surface; $n_{11} = 8 \cdot 10^5$, $n_{12} = 3.6 \cdot 10^5$, $n_{13} = 1.6 \cdot 10^2$, $n_{21} = 4.8 \cdot 10^4$, $n_{22} = 2.6 \cdot 10^4$, $n_{31} = 2.7 \cdot 10^4$, $n_{32} = 4.6 \cdot 10^4$. $\varphi(h)$ is independent of the content of elements, and for altitudes of 10, 25, and 50 m equal to 1.08, 1.24, and 1.55. The coefficients n_{ij} were determined by a direct method which, however, proved not to be very accurate. Since the spectra of the standard specimens and of the semi-space differ, the standard spectra were taken without and with a 25-cm water screening. The root-mean-square error in the determination of the elements was calculated after the fourth control flight and was found to amount to 25 %. The flightscovered an area of 5.5·10 km

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at intervals of 100 m at an altitude of 25 m. A clear relationship was found between the radium and thorium contents and the geological structure. The highest radium and thorium contents ($7 \cdot 10^{-4}$%, and $11 \cdot 10^{-4}$%, respectively) calculated according to aerial survey results are found in such regions where effusive rocks of a medium composition appear in granite outcrops on the surface; the lowest, on the other hand ($1.5 \cdot 10^{-4}$% for radium and $4.0 \cdot 10^{-4}$% for thorium) are found where effusive rocks of a basic composition appear. The radium content determined from the aircraft is, on the average, by 28%, and the thorium content by 21%, less than the contents determined by radiochemical analysis. The introduction of a correction factor K=1.1 in n_3 improves results considerably. As, however, the number of analyses performed is small, their accuracy is insufficient. The conclusion is drawn that errors caused by tolerances in prematurely introduced coefficients can be eliminated by this correction. The potassium content in effusive-sedimentary rocks fluctuated between 1 and 2% and attained 2.5% in granite, which agrees with data available in the literature. V. N. Vasilenko, Z.V. Kuznetsova and I. V. Yagodovskiy

Determination of the content of ... S/089/61/010/006/007/011
B136/B201

are thanked for having supplied geological material. There are 2 figures, 1 table, and 3 Soviet-bloc references.

SUBMITTED: July 14, 1960

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